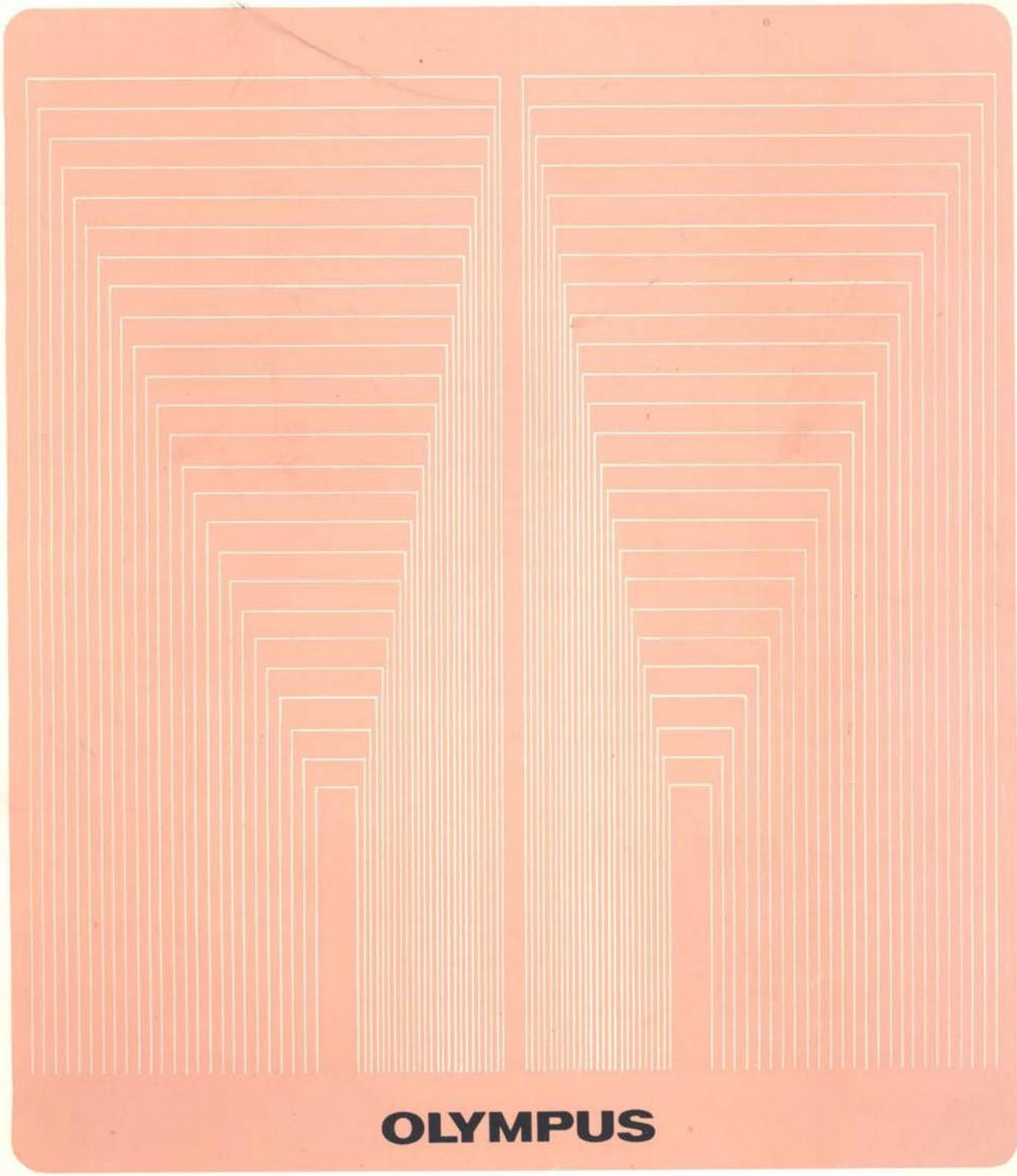
OLYMPUS OPERATION MICROSCOPE FOR OPHTHALMOLOGY

INSTRUCTION MANUAL

MODEL **OME-G**



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This instruction manual has been written for the use of the Olympus Operation Microscope (for ophthalmology) Model OME-G. It is recommended that you read the manual carefully in order to familiarize yourself fully with the use of the microscope so that you obtain optimum performance from this precision instrument.

Observe the following points carefully:

1. Operation

① Always handle the microscope with the care it deserves and **avoid abrupt motions.**

② **Avoid** exposure of the microscope to **direct sunlight, high temperature** and **humidity, dust** and **vibration.**

③ This microscope is not explosion proofed. **Do not operate it where inflammable gases are used.**

④ Direct the **longer leg** of the tripod base towards the direction of movement when **maneuvering** the microscope.

⑤ Make it a point to clamp the **drop prevention ring** on the pillar.

⑥ Connect the **ground wire** correctly.

⑦ Do not cover the lamp housing with drape, etc., when the lamp is on.

2. Disinfection

① Rubber caps, microscope control levers and knobs should be disinfected with boiling water or formalin gas.

② Binocular observation tube, eyepieces and objectives should be disinfected with formalin gas (do not use ethylene oxide gas).

③ Disinfection is completed by covering the microscope with sterile drape.

3. Maintenance

① To clean lens surfaces, wipe them lightly with gauze. If stained with fingerprints, grease, etc., they should be wiped off with gauze moistened with a **small** amount of xylene, alcohol or ether.

② Do not use organic solutions to wipe the surfaces of various components. Plastic parts, especially, should be cleaned with a neutral detergent.

③ **Never disassemble** the microscope for repair.

④ After use the microscope should be covered with the vinyl dust cover provided.

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CHECK LIST BEFORE OPERATION OF MODELS OME

Check the following points to ensure correct operation of the microscope:

I. Checks before switching on the microscope

① Is the drop prevention ring clamped?

② Is the universal arm balanced for the vertical movement? (See B, page 12.)

③ Slide the universal arm up and down by hand to ensure its movement along the pillar without interference.

④ Move the rotating parts of the arm with hands to ensure they are adjusted at the proper tension.

II. Checks after switching on

① Ascertain that the lamp is functional and that the cooling fan is operating.

② Switch to the spare lamp and check whether it is functional. (See ❹ page 6.)

③ Ascertain that the light is not partially obscured or unduly reduced in intensity.

Check the following points: 1) Is the shutter fully retracted?

2) Is the lamp holder unit in its proper position?

3) Is the light guide firmly connected?

④ Check whether motorized magnification change, coarse focus and fine focus respond smoothly.

⑤ It is suggested to bring the fine focus adjustment to the middle of the working range to provide an adequate leeway for up and down movement.

III. Check the electronic flash

① Make sure that the electronic flash is charging by listening for a "beep" tone after turning on the power switch.

② Ascertain that the synch lever for the camera is set to position "X".

③ The shutter speed should be slower than 1/60 sec.

④ Ascertain correct flash operation by connecting the synch cord before loading the camera with film.

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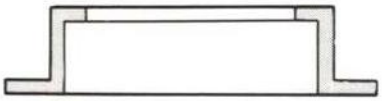
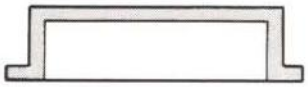
■ **Types of rubber caps and their positions on the microscope**

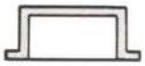
① Tilt tension adjustment ring



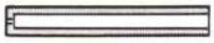
② Tilt, magnification and focusing knob



③ Shutter knobs for slit and inclined, illuminators



④ Control levers for slit width and slit image movement



⑤ Other knobs

⑥ Filter selector lever

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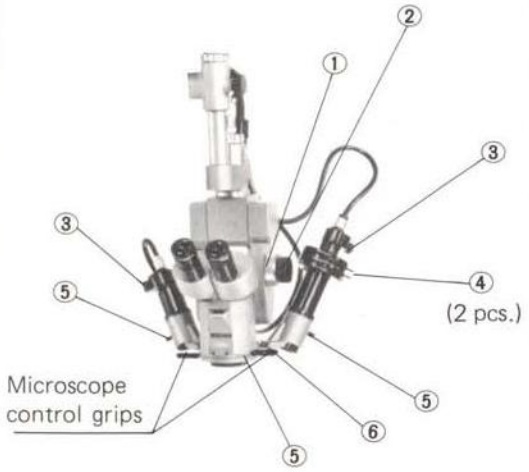
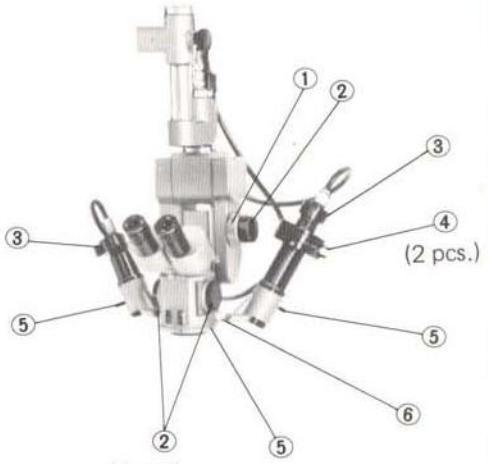


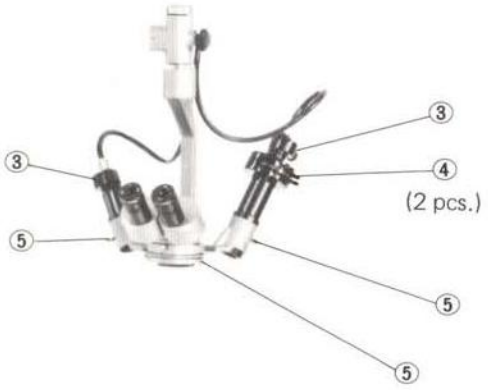
NO	①	②	③	④	⑤	⑥
Q'ty	1	1	2	2	3	1

OME-GB



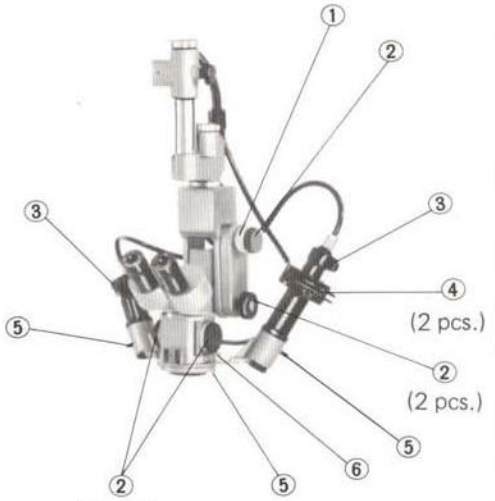
NO	①	②	③	④	⑤	⑥
Q'ty	1	3	2	2	3	1

OME-GC



NO	①	②	③	④	⑤	⑥
Q'ty	0	0	2	2	3	0

OME-GD



NO	①	②	③	④	⑤	⑥
Q'ty	1	5	2	2	3	1

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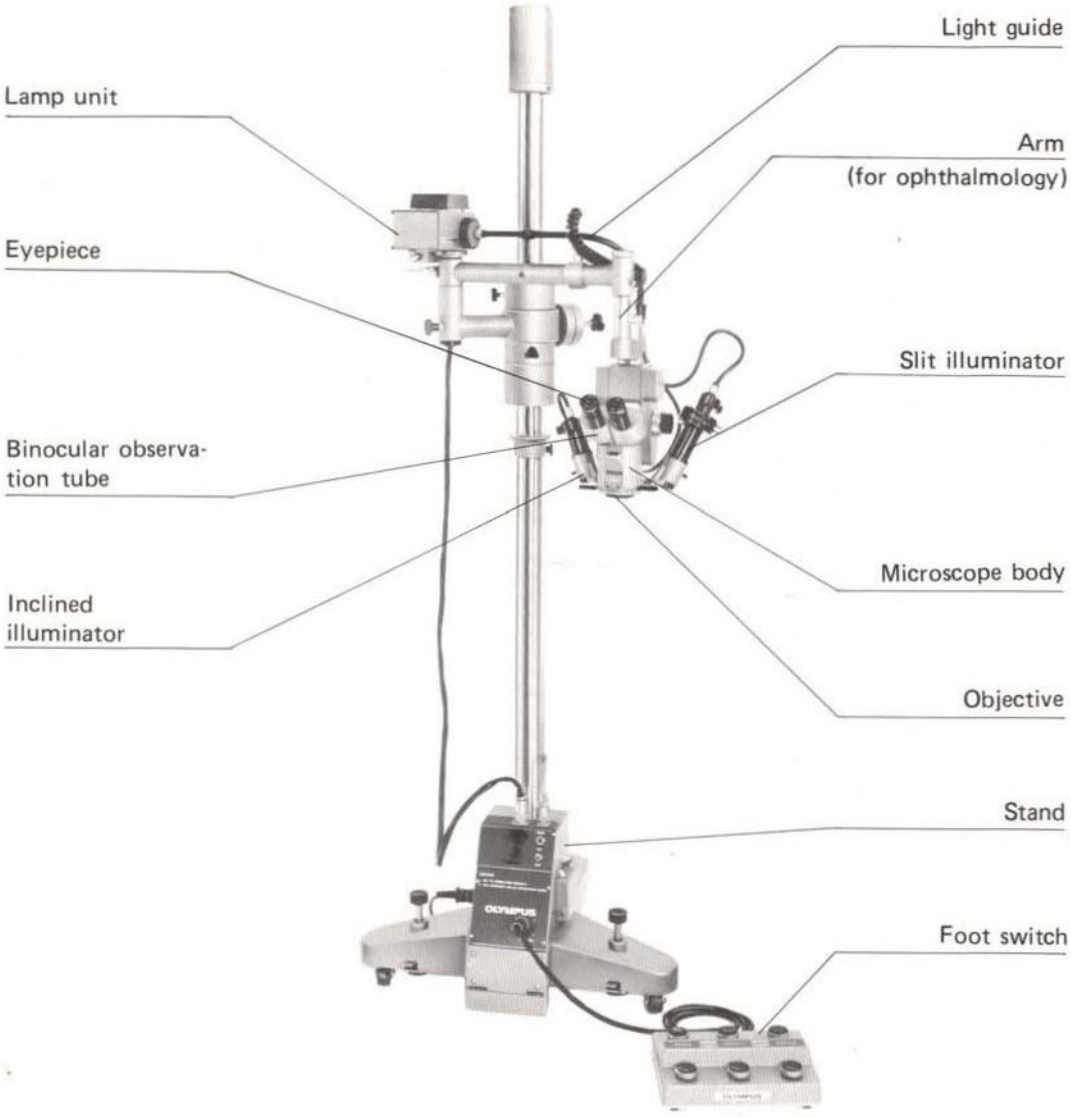
I. STANDARD EQUIPMENT

Module			Quantity	Model OME-			
				GA	GB	GC	GD
Stands	0-type manual stand	ST-00	1				○
	1-type manual stand	ST-01	1		○		
	1-type motorized stand	ST-11	1	○		○	
Arm (for ophthalmology)		OPA	1	○	○		○
Light guides	Light guide 2	LG-2	1			○	
	Light guide 3	LG-3	1	○	○		○
Light sources	Slit illuminator	SL	1	○	○	○	○
	Inclined illuminator	OBL	1	○	○	○	○
Microscope bodies	Motorized zoom magnification and fine focus body for ophthalmology	FAZ-1	1	○			
	Manual drum magnification and motorized fine focus body for ophthalmology	FAD-1	1		○		
	Manual drum magnification and manual fine focus body for ophthalmology	FMD-1	1				○
	Fixed magnification ~~and manual fine focus~~ body for ophthalmology	BA	1			○	
Binocular observation tube, inclined 45°		BI45	1	○	○	○	○
Objective		OB-170	1	○	○	○	○
Eyepieces	OME-GWH10X		1	○	○	○	○
	OME-GWH10X-C		1	○	○	○	○
Foot switches	Foot switch 2	FS-2	1	○			
	Foot switch 3	FS-3	1		○	○	
Lamp holder units		LU	2	○	○	○	○
Halogen lamps PHILIPS No. 6423, 15V, 150W			2	○	○	○	○
Spare fuses 3A Slow type			2	○	○	○	○
Hex. spanner wrenches, 4mm & 2mm (set of 2)			1	○	○	○	○
Vinyl dust cover			1	○	○	○	○

II. NOMENCLATURE

The Model OME-G is composed of various components, of which a broad variety of combination models is available according to your requirements. The photo below shows the Model OME-GA.

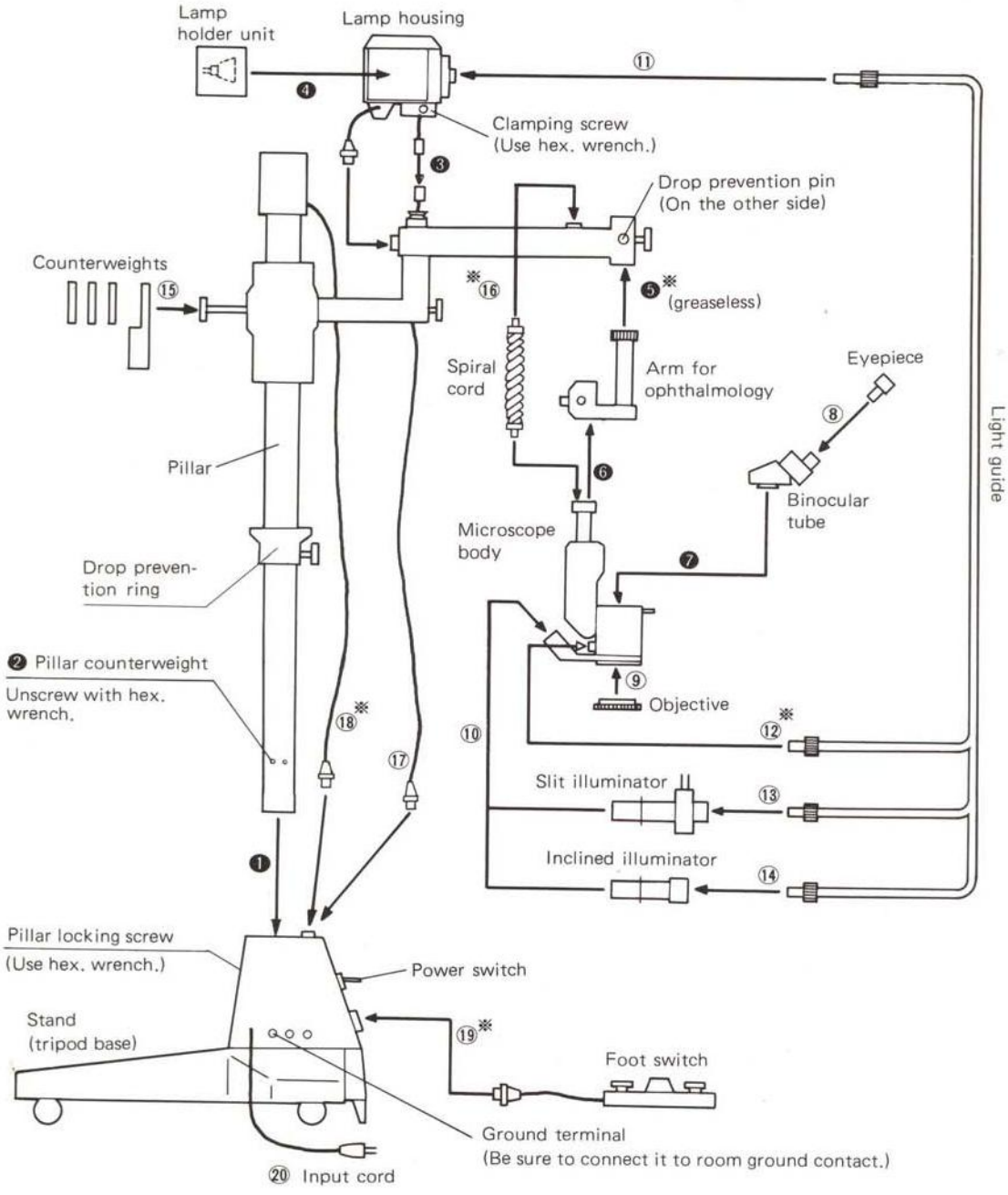


III. ASSEMBLY

The picture below illustrates the sequential procedure of assembly. The numbers indicate the assembly order of various components.

★ Take care to keep all glass surfaces clean, and avoid scratching the surfaces.

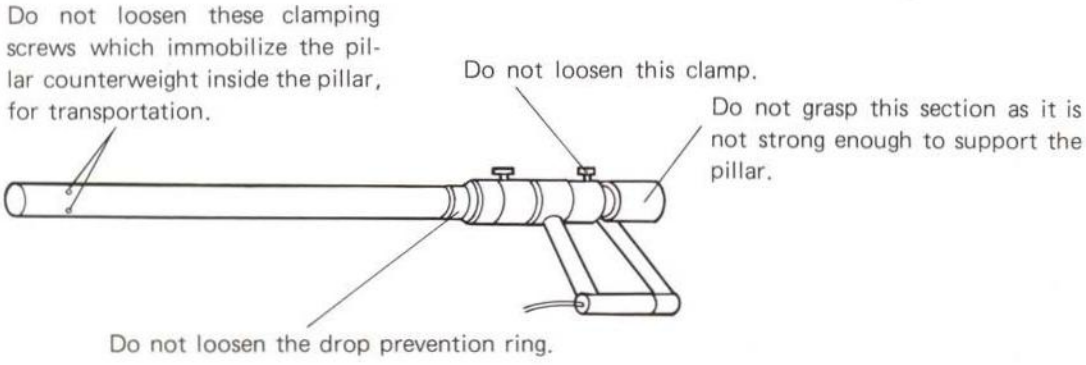
NOTE: As steps ❶ through ❼ are especially important, read the explanations in detail on the following pages.

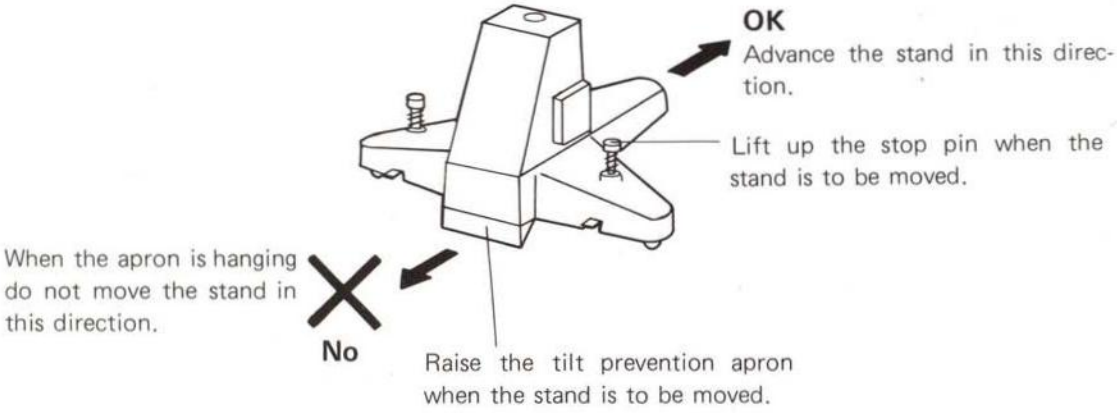


※ Steps ❺ ⑫ ⑯ ⑱ and ⑲ are not always necessary, depending on instrument combinations.

■ Explanations in detail

(Hints for transportation and assembly)


Do not loosen these clamping screws which immobilize the pillar counterweight inside the pillar, for transportation.
Do not loosen this clamp.
Do not grasp this section as it is not strong enough to support the pillar.
Do not loosen the drop prevention ring.


OK
Advance the stand in this direction.
Lift up the stop pin when the stand is to be moved.
When the apron is hanging do not move the stand in this direction.
No
Raise the tilt prevention apron when the stand is to be moved.

❶ Set up the pillar.

a) Loosen the pillar locking screws on the tripod base with the hex. wrench (4mm) provided.

b) Slowly insert the pillar into the opening in the base.

c) Lock the pillar tightly with the pillar locking screws.

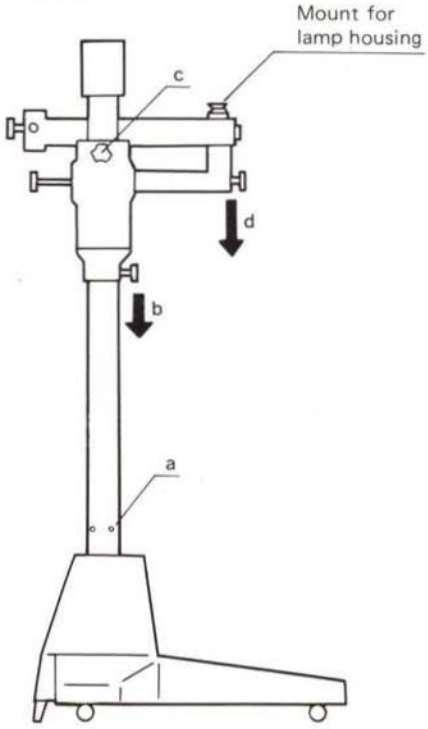
❷ Preparation for mounting the lamp housing (see picture right).

a) Loosen the three clamping screws which immobilize the pillar counterweight inside the pillar.

b) Loosen and lower the drop prevention ring.

c) Loosen the vertical clamping screw.

d) Lower the horizontal arm until the mount for lamp housing comes to operator eye level, then clamp the vertical clamping screw.



❸ Mounting the lamp housing (Fig. 1)

a) Connect the two nylon connectors ① .

b) Insert the nylon connectors into the opening of the lamp housing mount ② and place the lamp housing ③ on the mount ② .

c) Clamp three clamping screws with hex. wrench (2mm).

★ **When mounting the lamp housing the light guide mount ④ should point in the direction of the universal arm ⑤ .**

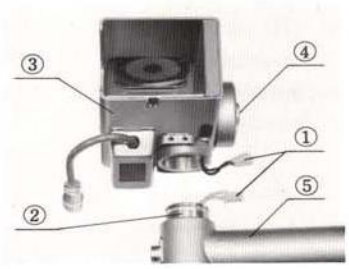


Fig. 1

❹ Installing the lamp

a) Insert the lamp terminal into the lamp holder unit.

b) Aligning the locating groove ① of the lamp socket with the locating pin ② of the lamp, insert the lamp into the pressure spring, and pressing down the lamp, keep it in contact with the lamp socket. (Fig. 2)

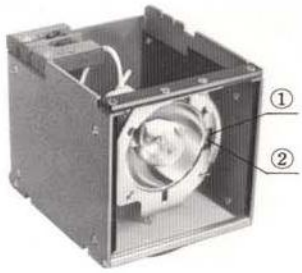


Fig. 2

★ **Lamp replacement should take place in the reverse order after the burned-out lamp has cooled.**

c) Carefully insert the lamp holder unit ① into the lamp housing ② until it comes in contact with the contact surface ③ .
At this position, the lamp holder unit is electrically connected and in the correct position for optical alignment. (Fig. 3)

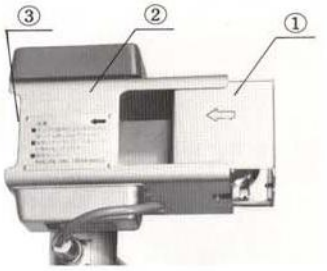


Fig. 3

d) Place the second lamp holder unit at the right-hand side of the lamp housing.

e) When one lamp is burned out, slowly insert the replacement lamp holder unit ① into the housing in the direction indicated by an arrow until it is correctly positioned in place of the burned-out lamp ② . At this instance the replacement lamp will light up. (Fig. 4)

★ **Do not remove the lamp holder unit ② until the replacement lamp holder unit ① is completely installed.**

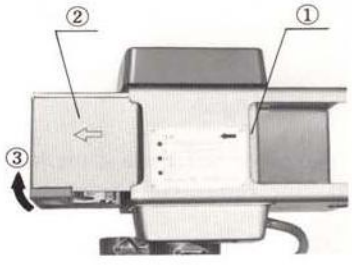


Fig. 4

f) Remove the first lamp holder unit by lifting it in the arrow direction ③ . (Fig. 4)

❺ **Mounting the arm for opthalmology (Fig. 5)**

a) Loosen the clamping screw ② of the universal arm ① .

b) Pulling out the drop prevention pin ③ , insert the arm mounting shaft ④ into the universal arm ① (as the arrow indicates).
Release the pin ③ and the arm will not drop.

c) Securely clamp the drop prevention nut ⑤ .

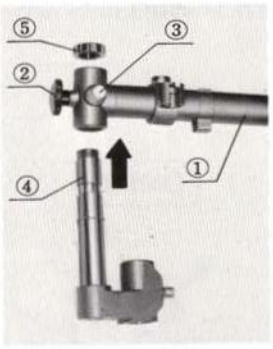


Fig. 5

❻ **Mounting the microscope body (Fig. 6)**

a) Loosen the clamping screw ① of the arm with hex. wrench (4mm).

b) With the drop prevention pin ② pulled out, insert the microscope body mounting shaft ③ into the arm, and aligning locating pin ④ and locating groove, release the pin ② .
It will engage into a groove on the shaft ③ and prevent the microscope body from falling down.

c) Tighten the drop prevention nut ⑤ and clamping screw ① securely.

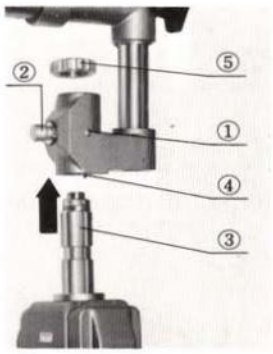


Fig. 6

❼ **Mounting the observation tube (Fig. 7)**

a) Loosen the clamping screw ① of the microscope body.

b) Aligning the locating groove ② on the microscope body with the locating pin of the binocular tube, insert the binocular tube into the microscope body.

★ **Ascertain that the clamping screw ① is in alignment with the red dot ③ of the binocular tube.**

★ **In order to assure correct position of the observation tube rotate the tube slightly before clamping with screw ① .**

c) Tighten the clamping screw ① .

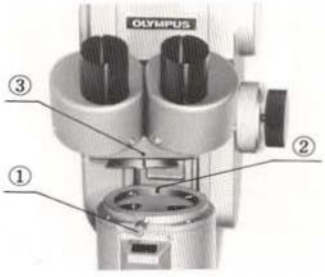
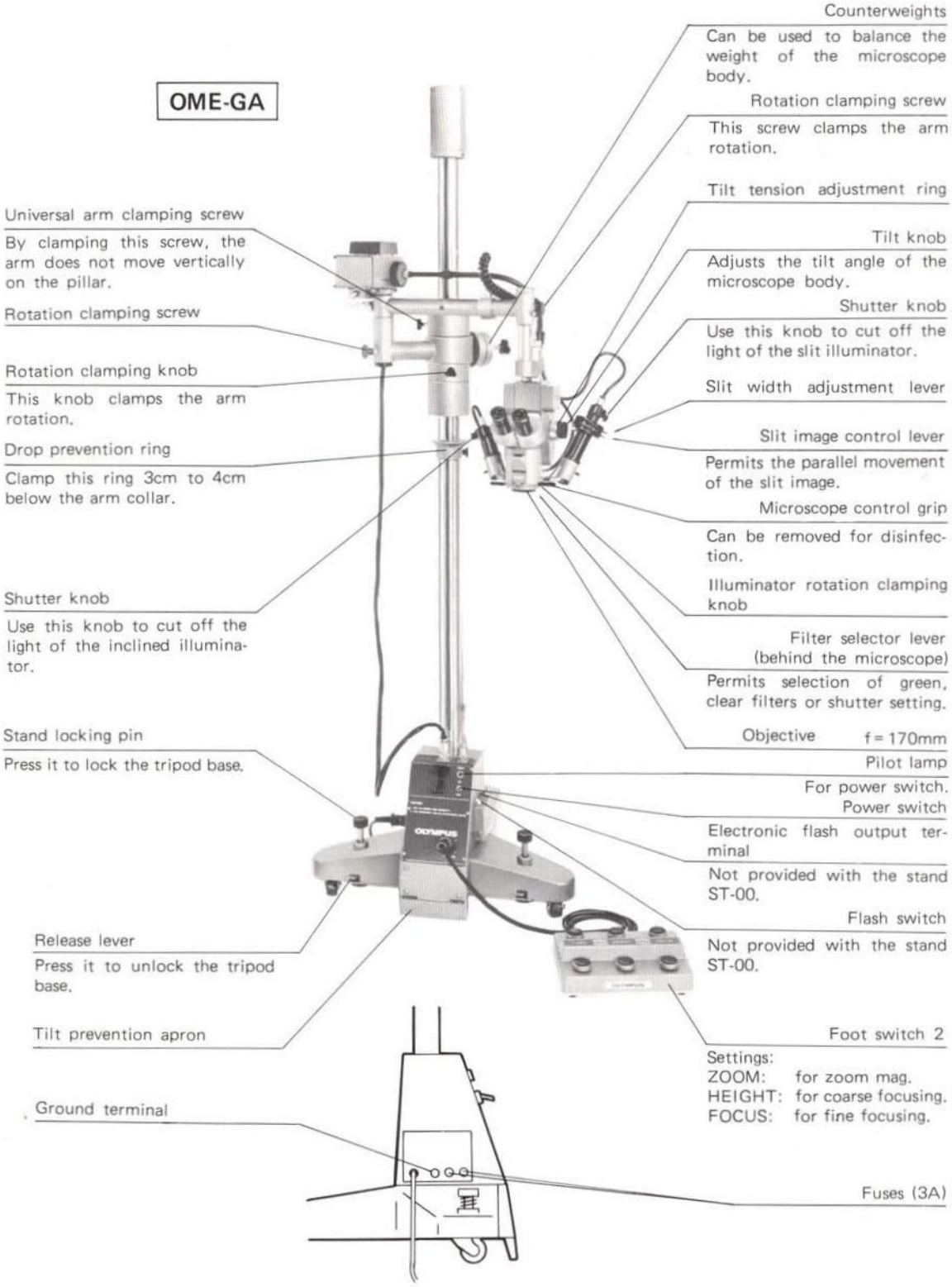


Fig. 7

IV. DESCRIPTION OF VARIOUS COMPONENTS


OME-GA
Counterweights
Can be used to balance the weight of the microscope body.
Rotation clamping screw
This screw clamps the arm rotation.
Tilt tension adjustment ring
Tilt knob
Adjusts the tilt angle of the microscope body.
Shutter knob
Use this knob to cut off the light of the slit illuminator.
Slit width adjustment lever
Slit image control lever
Permits the parallel movement of the slit image.
Microscope control grip
Can be removed for disinfection.
Illuminator rotation clamping knob
Filter selector lever (behind the microscope)
Permits selection of green, clear filters or shutter setting.
Objective f = 170mm
Pilot lamp
For power switch.
Power switch
Electronic flash output terminal
Not provided with the stand ST-00.
Flash switch
Not provided with the stand ST-00.
Foot switch 2
Settings:
ZOOM: for zoom mag.
HEIGHT: for coarse focusing.
FOCUS: for fine focusing.
Fuses (3A)
Universal arm clamping screw
By clamping this screw, the arm does not move vertically on the pillar.
Rotation clamping screw
Rotation clamping knob
This knob clamps the arm rotation.
Drop prevention ring
Clamp this ring 3cm to 4cm below the arm collar.
Shutter knob
Use this knob to cut off the light of the inclined illuminator.
Stand locking pin
Press it to lock the tripod base.
Release lever
Press it to unlock the tripod base.
Tilt prevention apron
Ground terminal

Other modules not included in the Model OME-GA standard equipment:

GB

GC

GD

Foot switch 3

Selector switch on
the rear side:
Settings:
F: Fine focusing adj.
H: Coarse focusing adj.

V. OPERATION

■ Summary of Putting the Microscope in Operation

1. Set up the stand bedside and lock the tripod base. (See A, page 11.)
2. Adjust the balance of the microscope body with counterweights. (See B, page 12.)
3. Tighten the clamping screws at the rotating parts of the arm and adjust the rotation tension.
4. Adjust the tension of the focusing knobs. (GD), (See E, page 14.)
5. Lower the microscope body to optimum height for operation beforehand (manually or by motor drive).
6. Clamp the drop prevention ring. (See page 12.)
7. Swing the microscope body away from the bed and place the patient on the bed.
8. Attach the disinfected rubber caps to the microscope (or cover the entire body with a sterile drape).

★ Take care not to touch any part that is not disinfected.

9. Turn on the power switch on the tripod base.
10. Place the microscope body above the patient.
11. Make diopter adjustment for the operator's eye acuity. (See C, page 12.) (Focus on the double cross lines on eyepiece).
12. Adjust interpupillary distance.
13. Make fine adjustments of the microscope body in accordance with the area under observation.
14. Use the tilt knob, if necessary. (See page 14.)
15. Focus manually or by motor drive.
16. Select the optimum position of the slit illuminator and inclined illuminator.
17. Use the shutter knobs to pass or cut off the light.
18. The slit width and parallel movement of the slit illuminator can be adjusted by the use of control levers. (Since the slit image is conjugated at the focal point of the optical system for observation, focusing adjustment for the slit image is not particularly needed). (See F, page 14.)

A. Positioning the Stand

1) Press down the release lever on the tripod base to unlock the base.

2) Pushing the lower part of the stand, bring the microscope to the right side or left side of the bed (see Fig. 8) where the tripod base does not block the operation.

3) Pressing down the locking pins ① on both sides of the tripod base, lock the base.

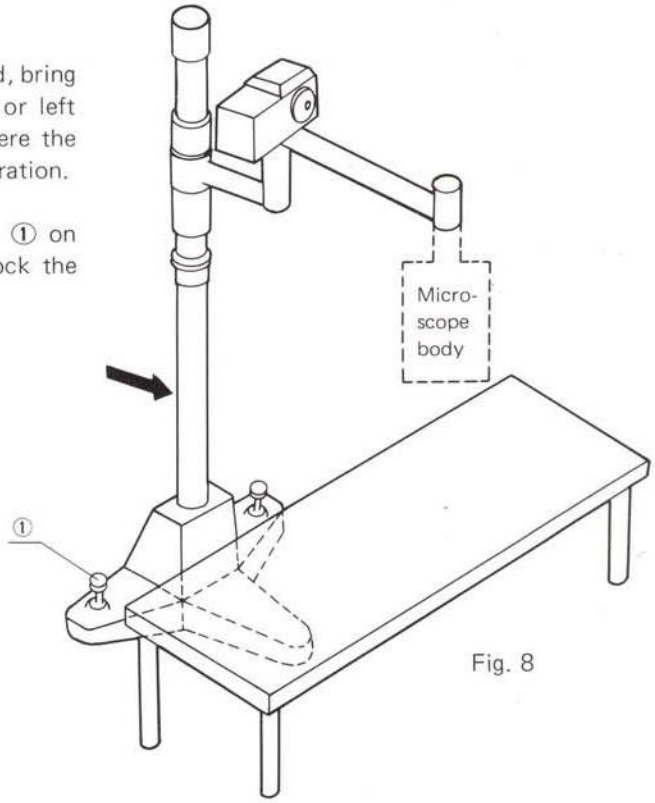


Fig. 8

CAUTION:

1) In principle, it is recommended to insert the longer leg of the tripod base under the bed (Fig. 8), although it may not be always practicable, depending on the bed design.

2) If the microscope is carried from room to room, fold the arm as compactly as possible, indicated in Fig. 9, and advance the microscope in the direction of the arrow.

★ **Prior to removal, do not forget to unlock the tripod base ① .**

If it is inevitable to move the microscope backward, lift the apron ② in the direction indicated by the arrow so that it does not strike on any obstacles on the way.

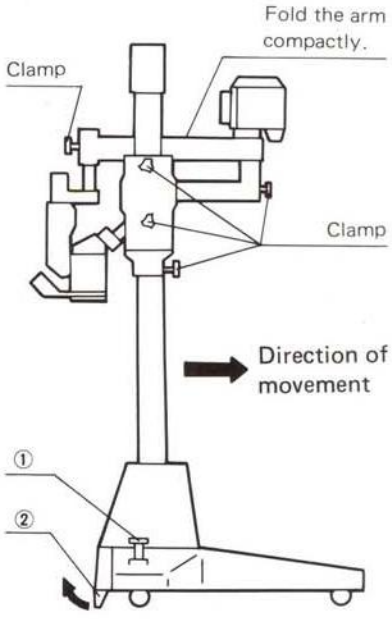


Fig. 9

B. Adjustment of the Microscope Balance for Vertical Movement

(This adjustment is required to prevent unintentional rise or fall of the microscope body.)

Adjust the microscope balance according to the type of the microscope body and the attachment of optional accessories as follows:

1) Move the universal arm up and down by hand. If it feels light when lifting the arm, attach a counterweight. If it feels light when lowering the arm, remove a counterweight. (Fig. 10)
Always use the counterweights ① first.

2) To attach a counterweight ① , place it on the mounting pin and push it against the shoulder ② of the pin.
Now screw knob ③ into mounting pin. (Fig. 11)

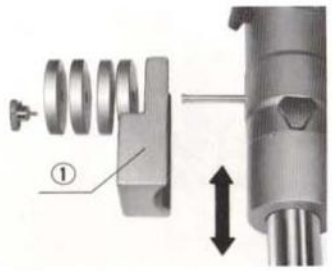


Fig. 10

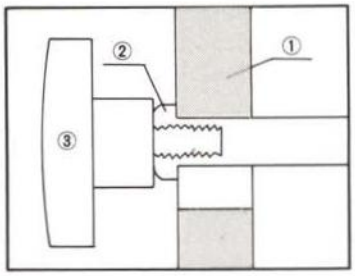


Fig. 11

◎ Setting of the drop prevention ring

(This procedure is very important to ensure the safety of the patient.)

1) Determine optimum height of the microscope body for operation.

2) Clamp the drop prevention ring ① 3cm to 4cm lower than the collar. (Fig. 12)

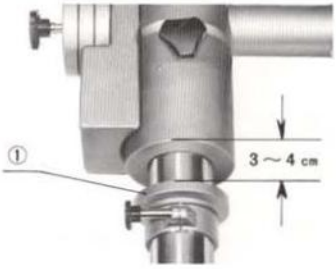


Fig. 12

C. Diopter Adjustment

(This procedure is necessary to prevent the image from going out of focus at magnification change or in photomicrography.)

Place a sheet of white paper or cloth on the area to be observed.

1) Choose highest zoom or drum magnification.

2) Looking through the eyepiece with cross lines (OME-GWH10X-C), rotate the helicoid ring of the eyepiece until the double cross lines can be most clearly seen. (Fig. 13)
After focusing on the cross lines, remove the white paper or cloth.

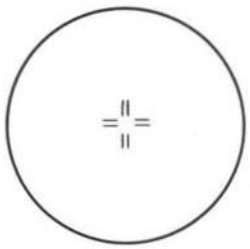


Fig. 13

3) Moving the arm vertically by hand or motor drive, bring the area to be observed into focus while looking through the eyepiece with cross lines (OME-GWH10X-C). For fine focusing, use the foot switch (FOCUS) or manual focusing knobs.

4) Next, looking through the eyepiece without cross lines (OME-GWH10X), focus on the area by rotating the eyepiece helicoid ring.

★ **During this procedure do not move the arm vertically or make focusing adjustments.**

5) By changing the zoom magnification or drum magnification from highest to lowest or vice versa, ascertain that the image does not go out of focus. If it goes out of focus, it may be caused by incomplete diopter adjustment, which requires to repeat steps 1) through 4).

D. Operation of the Tilt Knobs

a) Tilt tension adjustment ring

(This procedure prevents the microscope from falling by its own weight if the tilt knobs are operated.)

1) Rotate the tilt tension adjustment ring ① clockwise until the microscope body does not overturn by its own weight. (Fig. 14)
Note that the ring can be turned one complete rotation only before hitting an interval stop pin.

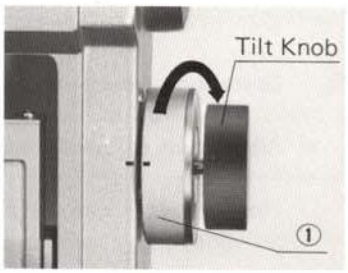


Fig. 14

2) If the ring stops before the red indexes are aligned (Fig. 15-①) pull out the adjustment ring ① (Fig. 15-②).
This disengages the stop pin. The ring is then rotated slightly and pushed back in its original position. It can now be rotated another full circle, etc.

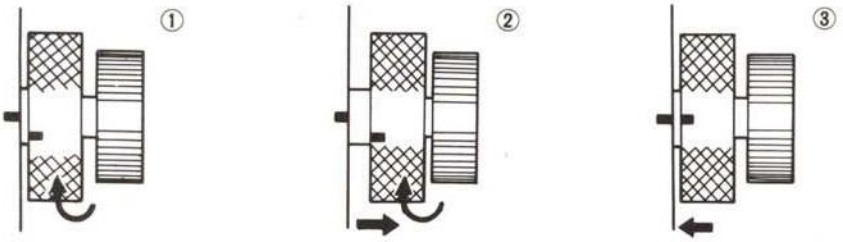


Fig. 15

3) If you obtain a proper tension while rotating the adjustment ring before the red indexes are aligned, pull out the adjustment ring and rotate it only until the red indexes are aligned as shown in Fig. 15-③, then release it back to click into position.

4) After the procedure above, the adjustment ring can be clamped (by rotating in clockwise direction), but cannot be loosened (by rotating counterclockwise).

b) Tilt knobs (Fig. 16)

1) Rotate the tilt knobs ② in either direction so as to obtain a proper tilt angle.

2) If the tension adjustment ring ① is properly tightened, the tilt angle can be freely adjusted only by rotating the tilt knobs ② without the use of the adjustment ring ① .

3) If the microscope body should be held in one position only, tighten the tilt tension adjustment ring fully.

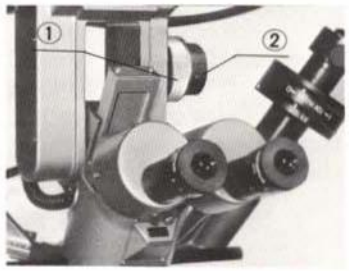


Fig. 16

E. Tension Adjustment of the Focusing Knob (for GD only)

The tension of the focusing knobs can be adjusted for either heavy or light movement depending on the operator's preference. To adjust the tension, securely hold the two focusing knobs with both hands and rotate them in opposite directions at the same time. (Fig. 17)

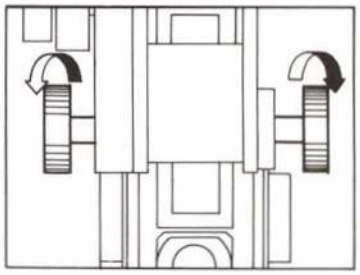


Fig. 17

F. Operation of the Slit Illuminator

a) Adjustment of the slit width

The slit width can be freely adjusted by rotating the slit width adjustment lever ① . (Fig. 18)

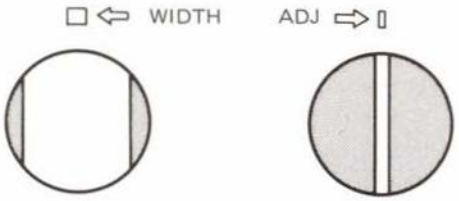
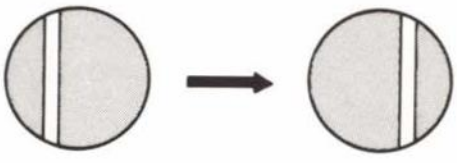


Fig. 18

b) Movement of the slit image

The slit image can be moved by rotating the slit image control lever ② . (Fig. 18)



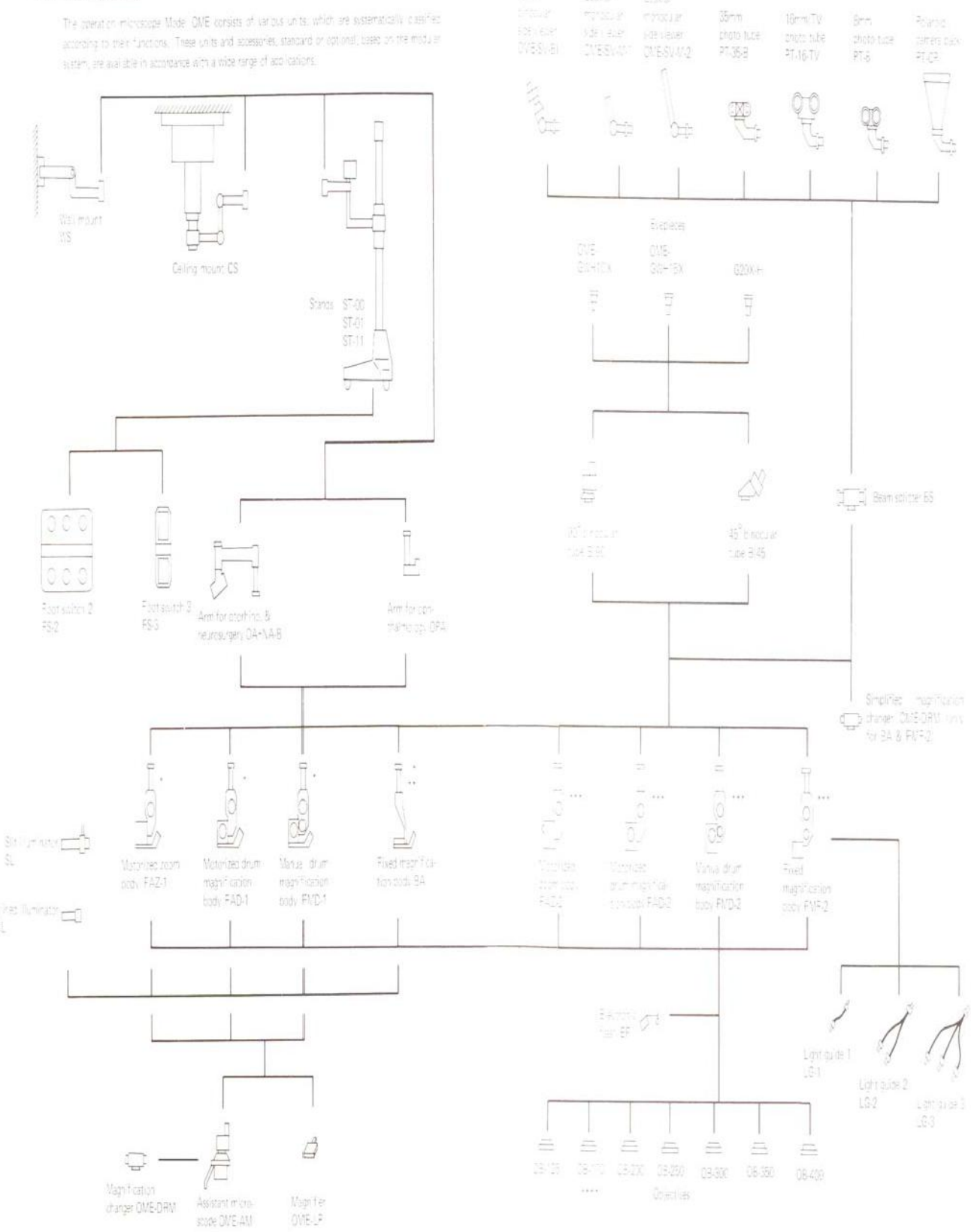
VI. OPTICAL DATA

- Eyepiece OME-GWH10X (Field number 24)
- Objective OB-170

Module combination	Magnification setting	Total magnification (for observation)	Field of view (dia)	Area illuminated by coaxial illuminator (dia)
GA (zoom magnification change)	1	4X	60mm	44mm
	2	8X	30mm	
	3	12X	20mm	
	4	16X	15mm	
	5	20X	12mm	
GB GD (drum magnification change)	1	3.6X	66mm	44mm
	2	5.8X	41mm	
	3	9.2X	26mm	
	4	14.6X	16mm	
	5	23.2X	10mm	
GC	———	9.2X	26mm	———

VII. UNIT SYSTEM

The operation microscope Model OME consists of various units, which are systematically classified according to their functions. These units and accessories, standard or optional, based on the modular system, are available in accordance with a wide range of applications.



NOTES: * For Opthalmology.
** The fixed magnification body 3A does not require the arm of OPA or OA-1A-B for opthalmology.

NOTES: *** For Otorhinolaryngology & Neurosurgery.
**** Objective for Opthalmology is only OB-170.

VIII. TROUBLESHOOTING

TROUBLES	CAUSES	REMEDIES
1. Observation system		
a) Incomplete binocular vision	The interpupillary distance is not correctly adjusted.	Correct the interpupillary distance.
	Diopter adjustment is incomplete.	Complete the diopter adjustment.
	The user is unaccustomed to binocular vision.	Prior to looking at the image of the specimen, try to look at the entire field of view, or look at a far away object before resuming microscopic observation.
b) The image goes out of focus at magnification change.	Diopter adjustment is incomplete.	Focus on the double cross lines of the eyepiece.
c) The area illuminated by the built-in illuminator is partially cut off.	The filter selector lever is stopped midway.	Click the selector lever into correct position.
	The light guide is loosely connected to the light source or to the microscope body.	Secure the connection.
d) The area illuminated by the inclined illuminator is partially cut off.	The shutter is midway.	Click the shutter into position.
e) Light intensity is extremely weakened.	The lamp housing is not correctly positioned.	Correct the position.
	The light guide is loosely connected to the light source or to the microscope body.	Secure the connection.
2. Coarse and fine focusing adjustments		
a) The microscope body (motorized or manual) slips down.	The counterweight is incorrectly balanced.	Adjust the balance correctly.
b) The motor drive cannot be activated. (GC) The motor drive focus does not function. (GB)	The switch on the base plate of the foot switch 3 is not correctly positioned.	Reset the switch correctly.
c) Focusing adjustment is too tight. (GD)	The focusing knobs are tightened too much.	Loosen the tension adjustment ring properly.
d) The focusing knobs are too light and the microscope body drops. (GD)	The focusing knobs are loosened too much.	Tighten the knobs properly.

TROUBLES	CAUSES	REMEDIES
3. Tilt of the microscope body		
a) The body rotates by its own weight.	The tilt tension adjustment ring is too light.	Adjust ring to proper tension.
4. Electrical system		
a) The lamp burns out too often.	The lamp is not the designated one.	Replace it with a standard lamp.
b) The lamp does not light up.	The fuse is burned out.	Replace the fuse.
	The lamp is burned out.	Replace the lamp.
	The electric cord is incorrectly connected.	Secure the connection.
	The thermal fuse is burned out in the lamp unit.	Clear off obstacles that block the ventilation opening of the cooling fan, and contact Olympus.
c) Fuse burns out too often.	The fuse is not the standard one.	Use a standard fuse.

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Printed in Japan 7902 M 02